7 - 8 FREQUENCY PROGRAMMING

Programming is accomplished as follows;
(Only the explanation for the transmit simplex mode is shown below, because the receive and transmit duplex modes use the same Phase Locked Loop (PLL) local oscillator circuit with simply a different crystal frequency.)

1) Determine the transmit simplex frequency to be programmed.
2) Use the formula below to determine the "N" number ("N" is a divider number in the PLL.):

$$\text{"N"} = \frac{\text{DOF} - 437.475}{0.0125} - 1000 \text{ (for the low band version)}$$

$$\text{"N"} = \frac{\text{DOF} - 447.500}{0.0125} - 1000 \text{ (for the high band version)}$$

DOF: Desired Operating Frequency (MHz)

To program the "N" number, subtract from the computed "N" the largest value that is programmable on the MATRIX board.
Again, subtract the largest programmable value from the remainder.
Proceed until the remainder is zero.

i.e. for DOF of 455.000 MHz

$$\text{"N"} = \frac{455.000 - 437.475}{0.0125} - 1000 = 402$$

Programming then requires P = 402 − 400 − 2 = 0,
You would place diodes in the N400 and N2 slots on the MATRIX board channel bus. Each channel has one associated bus which is labelled at the top with the channel number.
If duplex is required, a diode is installed in the "Duplex" row. This provides a +5MHz offset on transmit.
Channel frequencies programmed in the factory for testing are as shown in the table below;

Channel	Low band version	High band version
1	455.000 Simplex	465.025 Simplex
2	454.225 Duplex (Tramnsmit frequency; 459.225 MHz)	464.250 Duplex (Tramnsmit frequency; 469.250 MHz)
3~12	Not programmed	

When you change frequencies or add channels, install diodes on the MATRIX board according to the programming table.
The diodes may be inexpensive, small SILICON types available from many sources.

−WARNING−
GERMANIUM DIODES MUST NOT BE USED

Low. 42.455 .. CR42 43 ..44
H 45.467 .. .. 46 47

7 - 9 DIODE MATRIX PROGRAMMING TABLE (NO. 1) Low band (450 - 459.95 MHz) Version Simplex

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
450.000	2										●	
.025	4									●		
.050	6									●	●	
.075	8								●			
.100	10							●				
.125	12							●			●	
.150	14							●		●		
.175	16							●		●	●	
.200	18							●	●			
.225	20						●					
.250	22						●				●	
.275	24						●			●		
.300	26						●			●	●	
.325	28						●		●			
.350	30						●	●				
.375	32						●	●			●	
.400	34						●	●		●		
.425	36						●	●		●	●	
.450	38						●	●	●			
.475	40					●						
.500	42					●					●	
.525	44					●				●		
.550	46					●				●	●	
.575	48					●			●			
.600	50					●		●				
.625	52					●		●			●	
.650	54					●		●		●		
.675	56					●		●		●	●	
.700	58					●		●	●			
.725	60					●	●					
.750	62					●	●				●	
.775	64					●	●			●		
.800	66					●	●			●	●	
.825	68					●	●		●			
.850	70					●	●	●				
.875	72					●	●	●			●	
.900	74					●	●	●		●		
.925	76					●	●	●		●	●	
.950	78					●	●	●	●			
.975	80				●							
451.000	82				●						●	
.025	84				●					●		
.050	86				●					●	●	
.075	88				●				●			
.100	90				●			●				
.125	92				●			●			●	
.150	94				●			●		●		
.175	96				●			●		●	●	
.200	98				●			●	●			
.225	100			●								
.250	102			●							●	
.275	104			●						●		
.300	106			●						●	●	
.325	108			●					●			
.350	110			●				●				
.375	112			●				●			●	
.400	114			●				●		●		
.425	116			●				●		●	●	
.450	118			●				●	●			
.475	120			●			●					
.500	122			●			●				●	
.525	124			●			●			●		
.550	126			●			●			●	●	
.575	128			●			●		●			
.600	130			●			●	●				
.625	132			●			●	●			●	
.650	134			●			●	●		●		
.675	136			●			●	●		●	●	
.700	138			●			●	●	●			
.725	140			●		●						
.750	142			●		●					●	
.775	144			●		●				●		
.800	146			●		●				●	●	
.825	148			●		●			●			
.850	150			●		●		●				
.875	152			●		●		●			●	
.900	154			●		●		●		●		
.925	156			●		●		●		●	●	
.950	158			●		●		●	●			
.975	160			●		●	●					

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
452.000	162			●		●	●				●	
.025	164			●		●	●			●		
.050	166			●		●	●			●	●	
.075	168			●		●	●		●			
.100	170			●		●	●	●				
.125	172			●		●	●	●			●	
.150	174			●		●	●	●		●		
.175	176			●		●	●	●		●	●	
.200	178			●		●	●	●	●			
.225	180			●	●							
.250	182			●	●						●	
.275	184			●	●					●		
.300	186			●	●					●	●	
.325	188			●	●				●			
.350	190			●	●			●				
.375	192			●	●			●			●	
.400	194			●	●			●		●		
.425	196			●	●			●		●	●	
.450	198			●	●			●	●			
.475	200		●									
.500	202		●								●	
.525	204		●							●		
.550	206		●							●	●	
.575	208		●						●			
.600	210		●					●				
.625	212		●					●			●	
.650	214		●					●		●		
.675	216		●					●		●	●	
.700	218		●					●	●			
.725	220		●				●					
.750	222		●				●				●	
.775	224		●				●			●		
.800	226		●				●			●	●	
.825	228		●				●		●			
.850	230		●				●	●				
.875	232		●				●	●			●	
.900	234		●				●	●		●		
.925	236		●				●	●		●	●	
.950	238		●				●	●	●			
.975	240		●			●						
453.000	242		●			●					●	
.025	244		●			●				●		
.050	246		●			●				●	●	
.075	248		●			●			●			
.100	250		●			●		●				
.125	252		●			●		●			●	
.150	254		●			●		●		●		
.175	256		●			●		●		●	●	
.200	258		●			●		●	●			
.225	260		●			●	●					
.250	262		●			●	●				●	
.275	264		●			●	●			●		
.300	266		●			●	●			●	●	
.325	268		●			●	●		●			
.350	270		●			●	●	●				
.375	272		●			●	●	●			●	
.400	274		●			●	●	●		●		
.425	276		●			●	●	●		●	●	
.450	278		●			●	●	●	●			
.475	280		●		●							
.500	282		●		●						●	
.525	284		●		●					●		
.550	286		●		●					●	●	
.575	288		●		●				●			
.600	290		●		●			●				
.625	292		●		●			●			●	
.650	294		●		●			●		●		
.675	296		●		●			●		●	●	
.700	298		●		●			●	●			
.725	300		●	●								
.750	302		●	●							●	
.775	304		●	●						●		
.800	306		●	●						●	●	
.825	308		●	●					●			
.850	310		●	●				●				
.875	312		●	●				●			●	
.900	314		●	●				●		●		
.925	316		●	●				●		●	●	
.950	318		●	●				●	●			
.975	320		●	●			●					

DIODE MATRIX PROGRAMMING TABLE (NO. 2) Low band (450 - 459.95 MHz) Version

Simplex

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
454.000	322		●	●			●				●	
.025	324		●	●			●			●	●	
.050	326		●	●			●			●	●	
.075	328		●	●			●		●			
.100	330		●	●			●	●				
.125	332		●	●			●	●			●	
.150	334		●	●			●	●		●		
.175	336		●	●			●	●		●	●	
.200	338		●	●			●	●	●			
.225	340		●	●		●						
.250	342		●	●		●					●	
.275	344		●	●		●				●		
.300	346		●	●		●				●	●	
.325	348		●	●		●			●			
.350	350		●	●		●		●				
.375	352		●	●		●		●			●	
.400	354		●	●		●		●		●		
.425	356		●	●		●		●		●	●	
.450	358		●	●		●		●	●			
.475	360		●	●		●	●					
.500	362		●	●		●	●				●	
.525	364		●	●		●	●			●		
.550	366		●	●		●	●			●	●	
.575	368		●	●		●	●		●			
.600	370		●	●		●	●	●				
.625	372		●	●		●	●	●			●	
.650	374		●	●		●	●	●		●		
.675	376		●	●		●	●	●		●	●	
.700	378		●	●		●	●	●	●			
.725	380		●	●	●						●	
.750	382		●	●	●					●		
.775	384		●	●	●					●	●	
.800	386		●	●	●				●			
.825	388		●	●	●							
.850	390		●	●	●			●			●	
.875	392		●	●	●			●				
.900	394		●	●	●			●		●		
.925	396		●	●	●			●		●	●	
.950	398		●	●	●			●	●			
.975	400	●										
455.000	402	●									●	
.025	404	●								●	●	
.050	406	●								●	●	
.075	408	●							●			
.100	410	●						●				
.125	412	●						●			●	
.150	414	●						●		●		
.175	416	●						●		●	●	
.200	418	●						●	●			
.225	420	●					●					
.250	422	●					●				●	
.275	424	●					●			●		
.300	426	●					●			●	●	
.325	428	●					●		●			
.350	430	●					●	●				
.375	432	●					●	●			●	
.400	434	●					●	●		●		
.425	436	●					●	●		●	●	
.450	438	●					●	●	●			
.475	440	●				●						
.500	442	●				●					●	
.525	444	●				●				●		
.550	446	●				●				●	●	
.575	448	●				●			●			
.600	450	●				●		●				
.625	452	●				●		●			●	
.650	454	●				●		●		●		
.675	456	●				●		●		●	●	
.700	458	●				●		●	●			
.725	460	●				●	●					
.750	462	●				●	●				●	
.775	464	●				●	●			●		
.800	466	●				●	●			●	●	
.825	468	●				●	●		●			
.850	470	●				●	●	●				
.875	472	●				●	●	●			●	
.900	474	●				●	●	●		●		
.925	476	●				●	●	●		●	●	
.950	478	●				●	●	●	●			
.975	480	●			●							

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
456.000	482	●			●						●	
.025	484	●			●					●	●	
.050	486	●			●					●	●	
.075	488	●			●				●			
.100	490	●			●			●				
.125	492	●			●			●			●	
.150	494	●			●			●		●		
.175	496	●			●			●		●	●	
.200	498	●			●			●	●			
.225	500	●		●								
.250	502	●		●							●	
.275	504	●		●						●		
.300	506	●		●						●	●	
.325	508	●		●					●			
.350	510	●		●				●				
.375	512	●		●				●			●	
.400	514	●		●				●		●		
.425	516	●		●				●		●	●	
.450	518	●		●				●	●			
.475	520	●		●			●					
.500	522	●		●			●				●	
.525	524	●		●			●			●		
.550	526	●		●			●			●	●	
.575	528	●		●			●		●			
.600	530	●		●			●	●				
.625	532	●		●			●	●			●	
.650	534	●		●			●	●		●		
.675	536	●		●			●	●		●	●	
.700	538	●		●			●	●	●			
.725	540	●		●		●						
.750	542	●		●		●					●	
.775	544	●		●		●				●		
.800	546	●		●		●				●	●	
.825	548	●		●		●			●			
.850	550	●		●		●		●				
.875	552	●		●		●		●			●	
.900	554	●		●		●		●		●		
.925	556	●		●		●		●		●	●	
.950	558	●		●		●		●	●			
.975	560	●		●		●	●					
457.000	562	●		●		●	●				●	
.025	564	●		●		●	●			●		
.050	566	●		●		●	●			●	●	
.075	568	●		●		●	●		●			
.100	570	●		●		●	●	●				
.125	572	●		●		●	●	●			●	
.150	574	●		●		●	●	●		●		
.175	576	●		●		●	●	●		●	●	
.200	578	●		●		●	●	●	●			
.225	580	●		●	●							
.250	582	●		●	●						●	
.275	584	●		●	●					●		
.300	586	●		●	●					●	●	
.325	588	●		●	●				●			
.350	590	●		●	●			●				
.375	592	●		●	●			●			●	
.400	594	●		●	●			●		●		
.425	596	●		●	●			●		●	●	
.450	598	●		●	●			●	●			
.475	600	●	●									
.500	602	●	●								●	
.525	604	●	●							●		
.550	606	●	●							●	●	
.575	608	●	●						●			
.600	610	●	●					●				
.625	612	●	●					●			●	
.650	614	●	●					●		●		
.675	616	●	●					●		●	●	
.700	618	●	●					●	●			
.725	620	●	●				●					
.750	622	●	●				●				●	
.775	624	●	●				●			●		
.800	626	●	●				●			●	●	
.825	628	●	●				●		●			
.850	630	●	●				●	●				
.875	632	●	●				●	●			●	
.900	634	●	●				●	●		●		
.925	636	●	●				●	●		●	●	
.950	638	●	●				●	●	●			
.975	640	●	●			●						

DIODE MATRIX PROGRAMMING TABLE (NO. 3) Low band (450 - 459.95 MHz) Version
Simplex

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
458.000	642	●	●			●					●	
.025	644	●	●			●				●		
.050	646	●	●			●				●	●	
.075	648	●	●			●			●			
.100	650	●	●			●		●				
.125	652	●	●			●		●			●	
.150	654	●	●			●		●		●		
.175	656	●	●			●		●		●	●	
.200	658	●	●			●		●	●			
.225	660	●	●			●	●					
.250	662	●	●			●	●				●	
.275	664	●	●			●	●			●		
.300	666	●	●			●	●			●	●	
.325	668	●	●			●	●		●			
.350	670	●	●			●	●	●				
.375	672	●	●			●	●	●			●	
.400	674	●	●			●	●	●		●		
.425	676	●	●			●	●	●		●	●	
.450	678	●	●			●	●	●	●			
.475	680	●	●		●							
.500	682	●	●		●						●	
.525	684	●	●		●					●		
.550	686	●	●		●					●	●	
.575	688	●	●		●				●			
.600	690	●	●		●			●				
.625	692	●	●		●			●			●	
.650	694	●	●		●			●		●		
.675	696	●	●		●			●		●	●	
.700	698	●	●		●			●	●			
.725	700	●	●	●								
.750	702	●	●	●							●	
.775	704	●	●	●						●		
.800	706	●	●	●						●	●	
.825	708	●	●	●					●			
.850	710	●	●	●				●				
.875	712	●	●	●				●			●	
.900	714	●	●	●				●		●		
.925	716	●	●	●				●		●	●	
.950	718	●	●	●				●	●			
.975	720	●	●	●			●					
459.000	722	●	●	●			●				●	
.025	724	●	●	●			●			●		
.050	726	●	●	●			●			●	●	
.075	728	●	●	●			●		●			
.100	730	●	●	●			●	●				
.125	732	●	●	●			●	●			●	
.150	734	●	●	●			●	●		●		
.175	736	●	●	●			●	●		●	●	
.200	738	●	●	●			●	●	●			
.225	740	●	●	●		●						
.250	742	●	●	●		●					●	
.275	744	●	●	●		●				●		
.300	746	●	●	●		●				●	●	
.325	748	●	●	●		●			●			
.350	750	●	●	●		●		●				
.375	752	●	●	●		●		●			●	
.400	754	●	●	●		●		●		●		
.425	756	●	●	●		●		●		●	●	
.450	758	●	●	●		●		●	●			
.475	760	●	●	●		●	●					
.500	762	●	●	●		●	●				●	
.525	764	●	●	●		●	●			●		
.550	766	●	●	●		●	●			●	●	
.575	768	●	●	●		●	●		●			
.600	770	●	●	●		●	●	●				
.625	772	●	●	●		●	●	●			●	
.650	774	●	●	●		●	●	●		●		
.675	776	●	●	●		●	●	●		●	●	
.700	778	●	●	●		●	●	●	●			
.725	780	●	●	●	●							
.750	782	●	●	●	●						●	
.775	784	●	●	●	●					●		
.800	786	●	●	●	●					●	●	
.825	788	●	●	●	●				●			
.850	790	●	●	●	●			●				
.875	792	●	●	●	●			●			●	
.900	794	●	●	●	●			●		●		
.925	796	●	●	●	●			●		●	●	
.950	798	●	●	●	●			●	●			

DIODE MATRIX PROGRAMMING TABLE (NO. 4) High band (460.025 - 469.975 MHz) Version Simplex

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
460.025	2										●	
.050	4									●		
.075	6									●	●	
.100	8								●			
.125	10							●				
.150	12							●			●	
.175	14							●		●		
.200	16							●		●	●	
.225	18							●	●			
.250	20						●					
.275	22						●				●	
.300	24						●			●		
.325	26						●			●	●	
.350	28						●		●			
.375	30						●	●				
.400	32						●	●			●	
.425	34						●	●		●		
.450	36						●	●		●	●	
.475	38						●	●	●			
.500	40					●						
.525	42					●					●	
.550	44					●				●		
.575	46					●				●	●	
.600	48					●			●			
.625	50					●		●				
.650	52					●		●			●	
.675	54					●		●		●		
.700	56					●		●		●	●	
.725	58					●		●	●			
.750	60					●	●					
.775	62					●	●				●	
.800	64					●	●			●		
.825	66					●	●			●	●	
.850	68					●	●		●			
.875	70					●	●	●				
.900	72					●	●	●			●	
.925	74					●	●	●		●		
.950	76					●	●	●		●	●	
.975	78					●	●	●	●			
461.000	80				●							
.025	82				●						●	
.050	84				●					●		
.075	86				●					●	●	
.100	88				●				●			
.125	90				●			●				
.150	92				●			●			●	
.175	94				●			●		●		
.200	96				●			●		●	●	
.225	98				●			●	●			
.250	100			●								
.275	102			●							●	
.300	104			●						●		
.325	106			●						●	●	
.350	108			●					●			
.375	110			●				●				
.400	112			●				●			●	
.425	114			●				●		●		
.450	116			●				●		●	●	
.475	118			●				●	●			
.500	120			●			●					
.525	122			●			●				●	
.550	124			●			●			●		
.575	126			●			●			●	●	
.600	128			●			●		●			
.625	130			●			●	●				
.650	132			●			●	●			●	
.675	134			●			●	●		●		
.700	136			●			●	●		●	●	
.725	138			●			●	●	●			
.750	140			●		●						
.775	142			●		●					●	
.800	144			●		●				●		
.825	146			●		●				●	●	
.850	148			●		●			●			
.875	150			●		●		●				
.900	152			●		●		●			●	
.925	154			●		●		●		●		
.950	156			●		●		●		●	●	
.975	158			●		●		●	●			

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
462.000	160			●		●	●					
.025	162			●		●	●				●	
.050	164			●		●	●			●		
.075	166			●		●	●			●	●	
.100	168			●		●	●		●			
.125	170			●		●	●	●				
.150	172			●		●	●	●			●	
.175	174			●		●	●	●		●		
.200	176			●		●	●	●		●	●	
.225	178			●		●	●	●	●			
.250	180			●	●							
.275	182			●	●						●	
.300	184			●	●					●		
.325	186			●	●					●	●	
.350	188			●	●				●			
.375	190			●	●			●				
.400	192			●	●			●			●	
.425	194			●	●			●		●		
.450	196			●	●			●		●	●	
.475	198			●	●			●	●			
.500	200		●									
.525	202		●								●	
.550	204		●							●		
.575	206		●							●	●	
.600	208		●						●			
.625	210		●					●				
.650	212		●					●			●	
.675	214		●					●		●		
.700	216		●					●		●	●	
.725	218		●					●	●			
.750	220		●				●					
.775	222		●				●				●	
.800	224		●				●			●		
.825	226		●				●			●	●	
.850	228		●				●		●			
.875	230		●				●	●				
.900	232		●				●	●			●	
.925	234		●				●	●		●		
.950	236		●				●	●		●	●	
.975	238		●				●	●	●			
463.000	240		●			●						
.025	242		●			●					●	
.050	244		●			●				●		
.075	246		●			●				●	●	
.100	248		●			●			●			
.125	250		●			●		●				
.150	252		●			●		●			●	
.175	254		●			●		●		●		
.200	256		●			●		●		●	●	
.225	258		●			●		●	●			
.250	260		●			●	●					
.275	262		●			●	●				●	
.300	264		●			●	●			●		
.325	266		●			●	●			●	●	
.350	268		●			●	●		●			
.375	270		●			●	●	●				
.400	272		●			●	●	●			●	
.425	274		●			●	●	●		●		
.450	276		●			●	●	●		●	●	
.475	278		●			●	●	●	●			
.500	280		●		●							
.525	282		●		●						●	
.550	284		●		●					●		
.575	286		●		●					●	●	
.600	288		●		●				●			
.625	290		●		●			●				
.650	292		●		●			●			●	
.675	294		●		●			●		●		
.700	296		●		●			●		●	●	
.725	298		●		●			●	●			
.750	300		●	●								
.775	302		●	●							●	
.800	304		●	●						●		
.825	306		●	●						●	●	
.850	308		●	●					●			
.875	310		●	●				●				
.900	312		●	●				●			●	
.925	314		●	●				●		●		
.950	316		●	●				●		●	●	
.975	318		●	●				●	●			

DIODE MATRIX PROGRAMMING TABLE (NO. 5) High band (460.025 - 469.975 MHz) Version

Simplex

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
464.000	320		●	●			●					
.025	322		●	●			●				●	
.050	324		●	●			●			●		
.075	326		●	●			●			●	●	
.100	328		●	●			●		●			
.125	330		●	●			●	●				
.150	332		●	●			●	●			●	
.175	334		●	●			●	●		●		
.200	336		●	●			●	●		●	●	
.225	338		●	●			●	●	●			
.250	340		●	●		●						
.275	342		●	●		●					●	
.300	344		●	●		●				●		
.325	346		●	●		●				●	●	
.350	348		●	●		●			●			
.375	350		●	●		●		●				
.400	352		●	●		●		●			●	
.425	354		●	●		●		●		●		
.450	356		●	●		●		●		●	●	
.475	358		●	●		●		●	●			
.500	360		●	●		●	●					
.525	362		●	●		●	●				●	
.550	364		●	●		●	●			●		
.575	366		●	●		●	●			●	●	
.600	368		●	●		●	●		●			
.625	370		●	●		●	●	●				
.650	372		●	●		●	●	●			●	
.675	374		●	●		●	●	●		●		
.700	376		●	●		●	●	●		●	●	
.725	378		●	●		●	●	●	●			
.750	380		●	●	●							
.775	382		●	●	●						●	
.800	384		●	●	●					●		
.825	386		●	●	●					●	●	
.850	388		●	●	●				●			
.875	390		●	●	●			●				
.900	392		●	●	●			●			●	
.925	394		●	●	●			●		●		
.950	396		●	●	●			●		●	●	
.975	398		●	●	●			●	●			
465.000	400	●										
.025	402	●									●	
.050	404	●								●		
.075	406	●								●	●	
.100	408	●							●			
.125	410	●						●				
.150	412	●						●			●	
.175	414	●						●		●		
.200	416	●						●		●	●	
.225	418	●						●	●			
.250	420	●					●					
.275	422	●					●				●	
.300	424	●					●			●		
.325	426	●					●			●	●	
.350	428	●					●		●			
.375	430	●					●	●				
.400	432	●					●	●			●	
.425	434	●					●	●		●		
.450	436	●					●	●		●	●	
.475	438	●					●	●	●			
.500	440	●				●						
.525	442	●				●					●	
.550	444	●				●				●		
.575	446	●				●				●	●	
.600	448	●				●			●			
.625	450	●				●		●				
.650	452	●				●		●			●	
.675	454	●				●		●		●		
.700	456	●				●		●		●	●	
.725	458	●				●		●	●			
.750	460	●				●	●					
.775	462	●				●	●				●	
.800	464	●				●	●			●		
.825	466	●				●	●			●	●	
.850	468	●				●	●		●			
.875	470	●				●	●	●				
.900	472	●				●	●	●			●	
.925	474	●				●	●	●		●		
.950	476	●				●	●	●		●	●	
.975	478	●				●	●	●	●			

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
466.000	480	●			●							
.025	482	●			●						●	
.050	484	●			●					●		
.075	486	●			●					●	●	
.100	488	●			●				●			
.125	490	●			●			●				
.150	492	●			●			●			●	
.175	494	●			●			●		●		
.200	496	●			●			●		●	●	
.225	498	●			●			●	●			
.250	500	●		●								
.275	502	●		●							●	
.300	504	●		●						●		
.325	506	●		●						●	●	
.350	508	●		●					●			
.375	510	●		●				●				
.400	512	●		●				●			●	
.425	514	●		●				●		●		
.450	516	●		●				●		●	●	
.475	518	●		●				●	●			
.500	520	●		●			●					
.525	522	●		●			●				●	
.550	524	●		●			●			●		
.575	526	●		●			●			●	●	
.600	528	●		●			●		●			
.625	530	●		●			●	●				
.650	532	●		●			●	●			●	
.675	534	●		●			●	●		●		
.700	536	●		●			●	●		●	●	
.725	538	●		●			●	●	●			
.750	540	●		●		●						
.775	542	●		●		●					●	
.800	544	●		●		●				●		
.825	546	●		●		●				●	●	
.850	548	●		●		●			●			
.875	550	●		●		●		●				
.900	552	●		●		●		●			●	
.925	554	●		●		●		●		●		
.950	556	●		●		●		●		●	●	
.975	558	●		●		●		●	●			
467.000	560	●		●		●	●					
.025	562	●		●		●	●				●	
.050	564	●		●		●	●			●		
.075	566	●		●		●	●			●	●	
.100	568	●		●		●	●		●			
.125	570	●		●		●	●	●				
.150	572	●		●		●	●	●			●	
.175	574	●		●		●	●	●		●		
.200	576	●		●		●	●	●		●	●	
.225	578	●		●		●	●	●	●			
.250	580	●		●	●							
.275	582	●		●	●						●	
.300	584	●		●	●					●		
.325	586	●		●	●					●	●	
.350	588	●		●	●				●			
.375	590	●		●	●			●				
.400	592	●		●	●			●			●	
.425	594	●		●	●			●		●		
.450	596	●		●	●			●		●	●	
.475	598	●		●	●			●	●			
.500	600	●	●									
.525	602	●	●								●	
.550	604	●	●							●		
.575	606	●	●							●	●	
.600	608	●	●						●			
.625	610	●	●					●				
.650	612	●	●					●			●	
.675	614	●	●					●		●		
.700	616	●	●					●		●	●	
.725	618	●	●					●	●			
.750	620	●	●				●					
.775	622	●	●				●				●	
.800	624	●	●				●			●		
.825	626	●	●				●			●	●	
.850	628	●	●				●		●			
.875	630	●	●				●	●				
.900	632	●	●				●	●			●	
.925	634	●	●				●	●		●		
.950	636	●	●				●	●		●	●	
.975	638	●	●				●	●	●			

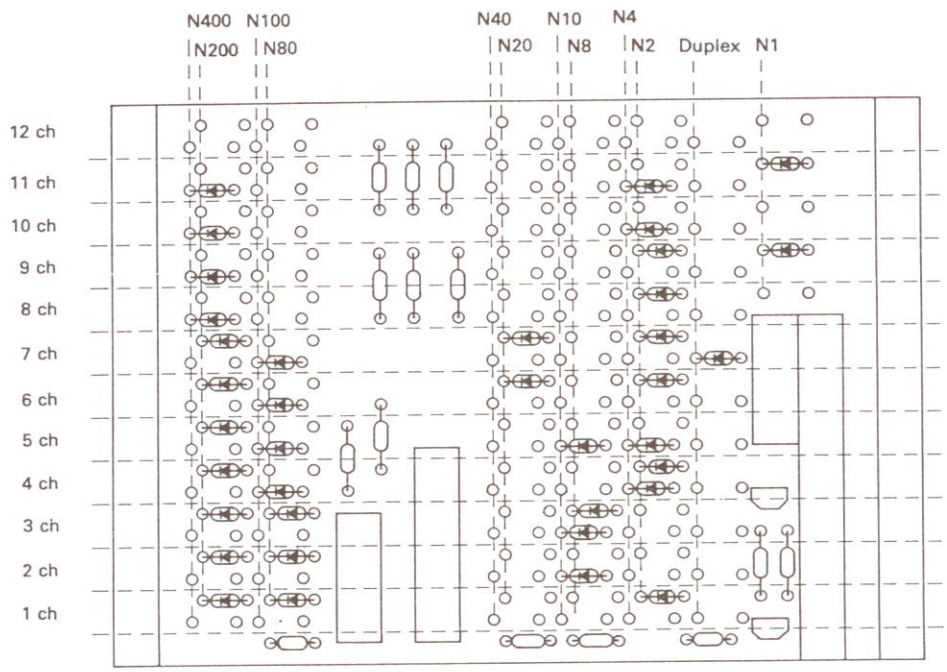
DIODE MATRIX PROGRAMMING TABLE (NO. 6) High band (460.025 - 469.975 MHz) Version Simplex

Operating frequency (MHz)	'N'	Diode position										
		N400	N200	N100	N80	N40	N20	N10	N8	N4	N2	N1
468.000	640	●	●			●						
.025	642	●	●			●					●	
.050	644	●	●			●				●		
.075	646	●	●			●				●	●	
.100	648	●	●			●			●			
.125	650	●	●			●		●				
.150	652	●	●			●		●			●	
.175	654	●	●			●		●		●		
.200	656	●	●			●		●		●	●	
.225	658	●	●			●		●	●			
.250	660	●	●			●	●					
.275	662	●	●			●	●				●	
.300	664	●	●			●	●			●		
.325	666	●	●			●	●			●	●	
.350	668	●	●			●	●		●			
.375	670	●	●			●	●	●				
.400	672	●	●			●	●	●			●	
.425	674	●	●			●	●	●		●		
.450	676	●	●			●	●	●		●	●	
.475	678	●	●			●	●	●	●			
.500	680	●	●		●							
.525	682	●	●		●						●	
.550	684	●	●		●					●		
.575	686	●	●		●					●	●	
.600	688	●	●		●				●			
.625	690	●	●		●			●				
.650	692	●	●		●			●			●	
.675	694	●	●		●			●		●		
.700	696	●	●		●			●		●	●	
.725	698	●	●		●			●	●			
.750	700	●	●	●								
.775	702	●	●	●							●	
.800	704	●	●	●						●		
.825	706	●	●	●						●	●	
.850	708	●	●	●					●			
.875	710	●	●	●				●				
.900	712	●	●	●				●			●	
.925	714	●	●	●				●		●		
.950	716	●	●	●				●		●	●	
.975	718	●	●	●				●	●			
469.000	720	●	●	●			●					
.025	722	●	●	●			●				●	
.050	724	●	●	●			●			●		
.075	726	●	●	●			●			●	●	
.100	728	●	●	●			●		●			
.125	730	●	●	●			●	●				
.150	732	●	●	●			●	●			●	
.175	734	●	●	●			●	●		●		
.200	736	●	●	●			●	●		●	●	
.225	738	●	●	●			●	●	●			
.250	740	●	●	●		●						
.275	742	●	●	●		●					●	
.300	744	●	●	●		●				●		
.325	746	●	●	●		●				●	●	
.350	748	●	●	●		●			●			
.375	750	●	●	●		●		●				
.400	752	●	●	●		●		●			●	
.425	754	●	●	●		●		●		●		
.450	756	●	●	●		●		●		●	●	
.475	758	●	●	●		●		●	●			
.500	760	●	●	●		●	●					
.525	762	●	●	●		●	●				●	
.550	764	●	●	●		●	●			●		
.575	766	●	●	●		●	●			●	●	
.600	768	●	●	●		●	●		●			
.625	770	●	●	●		●	●	●				
.650	772	●	●	●		●	●	●			●	
.675	774	●	●	●		●	●	●		●		
.700	776	●	●	●		●	●	●		●	●	
.725	778	●	●	●		●	●	●	●			
.750	780	●	●	●	●							
.775	782	●	●	●	●						●	
.800	784	●	●	●	●					●		
.825	786	●	●	●	●					●	●	
.850	788	●	●	●	●				●			
.875	790	●	●	●	●			●				
.900	792	●	●	●	●			●			●	
.925	794	●	●	●	●			●		●		
.950	796	●	●	●	●			●		●	●	
.975	798	●	●	●	●			●	●			

7 - 10 Installing diodes on the MATRIX unit

1) Carefully remove the MATRIX unit from the PLL unit.
2) Study the Diode Programming table (7-9) to locate the correct diode positions for the planned operating frequency.
3) Install and solder SILICON diodes on the MATRIX unit.
   The anode of each diode must be in the channel bus.
4) Mount the MATRIX unit back on the PLL unit.
5) Measure the transmit frequency the verify the diodes are installed correctly.
6) If the frequency is not correct, check the location and polarity of each diode.

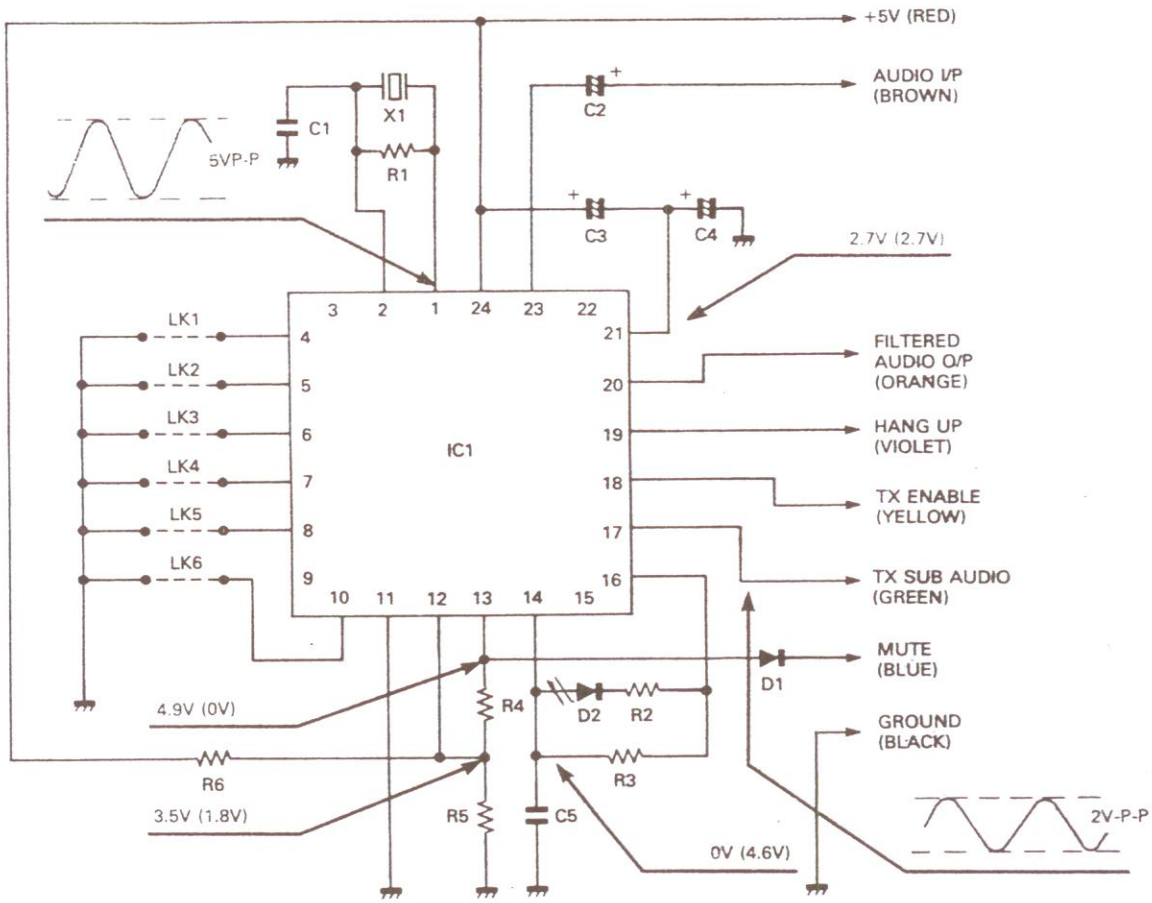
Example



Channel	Low band version	High band version	"N"
12	No action		0
11	455.0375	465.0625	405
10	455.025	465.050	404
9	455.0125	465.0375	403
8	455.000	465.025	402
7	459.000 (Dup.)	469.025 (Dup.)	322
6	454.000	464.025	322
5	453.900	463.925	314
4	453.800	463.825	306
3	453.700	463.725	298
2	453.600	463.625	290
1	453.500	463.525	282

EIA Specifications Programming Links

No.	Group	Freq (Hz)	LK1	LK2	LK3	LK4	LK5	LK6
1	A	67.0	H	H	H	H	H	H
2	B	71.9	L	H	H	H	H	H
3	C	74.4	H	H	H	H	H	L
4	A	77.0	L	L	H	H	H	H
5	C	79.7	H	H	H	H	L	H
6	B	82.5	L	H	H	H	H	L
7	C	85.4	H	H	H	H	L	L
8	A	88.5	L	L	H	H	H	L
9	C	91.5	H	H	H	L	H	H
10	B	94.8	L	H	H	H	L	H
11	—	97.4	H	H	H	L	H	L
12	A	100.0	L	L	H	H	L	H
13	B	103.5	L	H	H	H	L	L
14	A	107.2	L	L	H	H	L	L
15	B	110.9	L	H	H	L	H	H
16	A	114.8	L	L	H	L	H	H
17	B	118.8	L	H	H	L	H	L
18	A	123.0	L	L	H	L	H	L
19	B	127.3	L	H	H	L	L	H
20	A	131.8	L	L	H	L	L	H
21	B	136.5	L	H	H	L	L	L
22	A	141.3	L	L	H	L	L	L
23	B	146.2	L	H	L	H	H	H
24	A	151.4	L	L	L	H	H	H
25	B	156.7	L	H	L	H	H	L
26	A	162.2	L	L	L	H	H	L
27	B	167.9	L	H	L	H	L	H
28	A	173.8	L	L	L	H	L	H
29	B	179.9	L	H	L	H	L	L
30	A	186.2	L	L	L	H	L	L
31	B	192.8	L	H	L	L	H	H
32	A	203.5	L	L	L	L	H	H
33	B	210.7	L	H	L	L	H	L
34	A	218.1	L	L	L	L	H	L
35	B	225.7	L	H	L	L	L	H
36	A	233.6	L	L	L	L	L	H
37	B	241.8	L	H	L	L	L	L
38	A	250.3	L	L	L	L	L	L



The values in the parenthesis are the voltages when the input signal is modulated with the same tone frequency as programmed into the receiver CTCSS unit by links LK1 ~ LK6.

Falsing / Chopping Cut D2